North Carolina Department of Environment and Natural Resources

Division of Parks and Recreation

FIRE MANAGEMENT

GUIDELINES

September 2014

FIRE MANAGEMENT GUIDELINES

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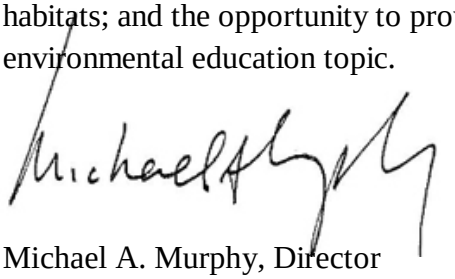
1.0 DIRECTOR'S STATEMENT

Historically, fire has played a dominant role in determining the distribution of plants and animals across much of North Carolina. Fire history studies have established that repeated fires operating along a broad scale of intensities and frequencies are a natural component of virtually every vegetated ecosystem. Consequently, ecologists now know that hundreds of plant and animal species that occur in North Carolina, including many that occur in our state parks, are dependent on fire for rejuvenation and reproduction.

Because fire is an inherent aspect of most vegetated ecosystems, it is important to recognize its long term ecological role in the maintenance of intact, normally functioning ecosystems. Since it is part of the Division's mission to perpetuate the presence of high quality natural resources, then where appropriate and feasible in our state parks, prescribed fire will be used to maintain and enhance fire adapted natural communities. The use of prescribed fire will allow the Division to accomplish a number of goals, including the removal of hazardous fuel levels; reduction of wildfire risk to neighboring properties; the protection of biological diversity; the protection of rare species and their habitats; and the opportunity to provide the public with timely information on an important environmental education topic.



Michael A. Murphy, Director

2.0 INTRODUCTION

Fire has played a prominent role in shaping all but the wettest or most arid natural communities of the United States. Fire history studies in the southeastern U.S. have documented frequent fires over at least the past 4,000 years, and for perhaps as long as 10,000 years (Fesenmyer and Christensen 2010). While few sites burned every year, fires likely burned somewhere in North Carolina every year. Widely varying terrestrial ecosystems reflect this long evolutionary resilience to repeated fire (Ryan *et al* 2013, Lafon *et al* 2007, Brown et al 2000, Elliott *et al* 1999, Frost 1998).

Fire dependent ecosystems exhibit high species diversity, and approximately 65 percent of the nearly 700 rare plant species that occur in North Carolina are known to be fire dependent (data from the NC Natural Heritage Program). Similar positive effects have been documented throughout the southeast for birds (Greenberg *et al* 2007, and Dickson *in* Ford *et al* 2002), amphibians (see Brown *et al* 2011), herpetofauna (Greenburg *in* Ford *et al* 2002), and other wildlife (see Van Lear and Harlow *in* Ford *et al* 2002).

Ecosystem diversity decreases when fire is suppressed. These effects include declines in fire tolerant species, increases in fire intolerant species, forest overstocking, and declines in herbaceous diversity. Animal communities react similarly, and include declines in avian, reptile, and mammalian diversity (Ryan *et al* 2013, Knapp *et al* 2009, Nowacki and Abrams 2008, Ford *et al* 2002, Elliott *et al* 1999, Frost 1998).

Although the North Carolina state park system has a well-established fire management program, it is not immune from the effects of fire suppression. Fire suppression policies since the 1920s have greatly reduced fire throughout the eastern US, with profound ecological consequences (Nowacki and Abrams 2008). Year round fire management is critical for the restoration and maintenance of our parks' natural resources. These guidelines are intended to improve fire management in the state parks system by:

- Insuring that fire management achieves specific short and long term resource management objectives;
- Minimizing undesirable secondary effects;
- Reducing the risk of injury, property damage, and liability;
- Increasing system-wide consistency in fire management;
- Improving the efficiency and cost-effectiveness of program activities; and
- Developing cooperative agreements with other fire management agencies.

3.0 POLICY

The goal of the DPR fire management program is a diverse array of ecologically diverse fire-adapted plant communities. The restoration and maintenance of these fire-adapted ecosystems will be dependent on fire regimes of varying severity, frequency, seasonality, weather and fuel combinations, and ignition patterns.

It is the policy of the North Carolina Division of Parks and Recreation that every park will develop a fire management program that: 1. Coordinates wildfire response, and 2. Where appropriate, applies prescribed fire on a landscape scale to restore and maintain fire-dependent natural communities. No park will initiate a fire management program without an approved plan (See Section 6.0). All DPR prescribed fire activities will follow the laws governing prescribed burning set out in the Article 80, North Carolina Prescribed Burning Act and the Article 78, Regulation of Open Fires (Appendices 1, 2)

4.0 PROGRAM ADMINISTRATION

4.1 Director

The Director of the Division of Parks and Recreation has overall responsibility for fire management in all areas administered by the Division. The Director sets program policy and standards. The Director will approve all cooperative agreements between the Division and other agencies and organizations. The Director must approve all recommendations of the Division Fire Management Team to be a Division Burn Boss.

4.2 Chief of Operations

The Chief of Operations (CHOP) is responsible for the approval of all park fire management plans and approves the selection of operations personnel to serve on the Division Fire Management Team. Along with the Chief of Planning and Natural Resources, the CHOP reviews and approves cooperative agreements with other organizations.

4.3 Chief of Planning and Natural Resources

The Chief of Planning and Natural Resources (CPNR) ensures that the natural resources section has the expertise to serve as effective fire science advisors to the Division, and approves the selection of natural resources management personnel to serve on the Division Fire Management Team. In the absence of an Ecological Burn Coordinator or Natural Resources Program Manager, the CPNR will assign a qualified individual to serve the roll of the Ecological Burn Coordinator for day of burn approvals. Along with the CHOP, the CPNR reviews and approves cooperative agreements with other organizations.

4.4 District Superintendent

District Superintendents (DISU) will review and approve fire management plans in their districts and ensure compliance with the Division's Fire Management Guidelines. The DISU will oversee the prescribed fire program and approve all prescriptions at the district level and, along with the Ecological Burn Coordinator, provide go/no go day-of-burn approvals.

4.5 Natural Resources Program Manager

The Natural Resources Program Manager (NRPM) leads the Division's Fire Management Team and is responsible for the application of scientific principles and concepts in the Division's fire program. This position serves the role of the Ecological Burn Coordinator in his or her absence.

4.6 Park Superintendent

Park Superintendents (PASU) will help prepare and approve the fire management plans and prescriptions within their parks. PASUs play a key role in coordinating fire management activities in the park in coordination with natural resources staff, NC Forest Service, and other partner organizations. PASUs will supervise the park's fire management records. Along with the Ecological Burn Coordinator and the DISU; the PASU must give day-of-burn approval.

4.7 Ecological Burn Coordinator

The Ecological Burn Coordinator (EBC) is the Division's prescribed fire specialist. The EBC serves on the Division Fire Management Team, approves all fire management plans and prescriptions, and conducts the complexity analysis for each prescription. Along with the PASU and DISU, the EBC approves the burn boss's go/no go day-of-burn decisions. The EBC can serve as the burn boss on all state park units.

4.8 Division Fire Management Team

The Division Fire Management Team (DFMT) was established in 2012 to serve as the main advisory group on Division fire policy and prescribed fire applications. The DFMT is led by the NRPM and consists of the EBC, one additional member from the natural resources staff, and four operations members, preferably one from each of the four districts. Operations staff members are recommended by the respective DISU to the DFMT for approval, who then forward for final approval by the CHOP. The DFMT meets regularly to update fire management guidelines as needed, evaluate fire-related incidents, respond to changes in the rapidly evolving field, and recommend certification of DPR burn bosses.

4.9 DPR Burn Boss

A burn boss is the person who has the legal responsibility for a prescribed fire. It will be the responsibility of the burn boss to ensure compliance with the Division's Fire Management Guidelines, the park's fire management plan, the burn unit prescription, and all applicable laws and

regulations. DPR burn bosses must be certified according to parameters defined in Section 8.3 (Burn Boss Certification). Where feasible, the burn boss will be on the staff at the park where the fire is occurring; however the burn boss may come from another park, DPR program, state division or other organization. The burn boss is in charge of the fire and, if necessary, all suppression activities until the fire is considered out or safely contained or they have been replaced by the NC Forest Service. It is the burn boss's responsibility to make sure that adequate staff and equipment are on hand to meet the requirements of the prescription and that all burn crew staff are adequately trained and equipped.

4.10 Public Information Officer

The Division's Public Information Officer (PIO), in coordination with the PASU and natural resources staff, will prepare and issue press releases informing the public of the status of significant wildfires in the parks, and of the scheduling and purpose of prescribed fires. The PIO will coordinate and administer web-based and social media contacts. The PIO will be notified prior to all prescribed fires.

4.11 Natural Resources Program

The Natural Resources Program (NRP) assists with the preparation of each park's fire management plans and prescriptions. NRP staff will provide assistance regarding fire ecology and fire management objectives. NRP staff will cooperate with other staff, agencies, and the scientific community on training, monitoring, fire ecology, interpretation and education efforts and advise the DFMT. The fire management database will be administered by the natural resources staff.

4.12 District Information and Education Specialist

The District Interpretation and Education Specialists (DIES) will provide assistance as needed with training and the development of interpretive fire programs.

5.0 COOPERATION WITH OTHER AGENCIES AND ORGANIZATIONS

Where appropriate, cooperative agreements with other agencies and organizations will be developed to facilitate fire management, information sharing, training, and annual planning. Cooperative burns across neighboring properties are to be encouraged to avoid unnecessary fire lines on DPR and neighboring properties. Cooperative agreements will be updated as necessary. When other agencies are burning DPR properties, the PASU, EBC and DISU must give day-of-burn approvals.

5.1 N.C. Forest Service

The N.C. Forest Service (NCFS) is responsible for wildfire control on all forested lands in North Carolina. DPR and NCFS have entered into a Cooperative Forest Fire Control Agreement (See Appendix 3).

5.2 Other Agencies and Organizations

Cooperative fire management and training agreements with local, state, and federal agencies and organizations other than NCFS will be considered, especially when those agencies own land near or adjacent to a park or if those agencies can provide support for fire management. There is a general acknowledgement that no one agency can accomplish all that needs to be done with prescribed and wild fires. At the time of writing, DPR has Memoranda of Understanding with the NCFS, the Wildlife Resources Commission, The Nature Conservancy, and the National Park Service.

5.3 Content of Cooperative Agreements

Agreements may include but not be limited to the following points:

- Who is in charge, and when, for various types of fire management and fire suppression actions.
- Release of liability
- Minimum training standards.
- A review of any specific park management or suppression issues that are to be addressed during either wildfires or prescribed fires.
- Levels of authority and channels of communication.
- Who communicates with the media concerning what types of incidents.
- Provisions for information sharing and joint training.
- Reimbursable costs for equipment, salaries, and services, if any.

5.4 Approval of Cooperative Agreements

All proposed cooperative agreements at the park or district level will be submitted through the PASU, DISU, and NRPM to the CHOP in written form for approval. All Division level agreements will be reviewed and approved by the CPNR and the CHOP. The CHOP will forward all division level cooperative agreements to the Director for approval.

6.0 PARK FIRE MANAGEMENT PLANS

There are two basic documents, *Park Fire Management Plans* (PFMP) and *Prescriptions*. PRMPs address the overall goals of fire on DPR properties and the operational aspect of prescribed and wild fires. PFMP's address the why and what-if of fire on DPR properties. PFMPs differ from prescriptions in the prescriptions cover the how of conducting prescribed fires and the plans cover the why. Park fire management plans are based on a thorough understanding of the park's fire ecology and are integrated with operations and resource management goals. Information should be collected from a variety of sources so that the plan can accurately address goals and objectives. The Division's fire management program will emphasize ecological management at the natural community level.

6.1 Review and Approval of the Park Fire Management Plan

Each park's fire management plan will be developed through the collaboration of park staff, the DISU, NRP staff, and personnel from other appropriate agencies or organizations. Each park's PFMP must be reviewed and approved by PASU, a representative of the NRP, the DISU, and the CHOP, in that order. A current signature approval page can be obtained from the NRP.

Each fire management plan will be reviewed annually at a meeting between the PASU or designee and the NCFS district forester or designee, as required by the current cooperative agreement between the Division and NCFS.

Periodic revisions to park boundaries, specific burn unit maps, prescribed fire management goals, etc. may be handled through consultation with appropriate DPR staff, including the NRP, and other qualified personnel as needed. The PASU will collaborate with the NRP in determining if the changes warrant review and approval at the DISU and CHOP level. If major changes to a park's fire plan are proposed, the PASU will review those revisions through the normal chain of command and approval.

6.2 Prescribed Fire Planning and Management

The Park Fire Management plan will include the following information related to prescribed fire:

- Park's prescribed fire management goals.
- Fire ecology of the park, including historical fire regime.
- Emergency response specific to park.
- Objectives for education, interpretation, and/or public engagement.
- Equipment and resources available to park.
- Visitor use during and after fires.
- Copies of all park-specific, fire-related cooperative agreements with other agencies, organizations, or adjacent landowners.
- A park map or maps, showing roads, firebreaks, access routes, smoke sensitive areas, fire hazard areas, and resource sensitive areas. The areas covered include satellite properties managed by the park unit.
- Wildfire response plan
- Signature cover page

6.3 Wildfire Planning and Management

All unplanned ignitions or prescribed fires that exceed control will be managed as wildfires. Under the terms of the MOU between the Division and the NCFS, the NCFS will assume overall command on wildfires that require their assistance. The annual PFMP review with the NCFS will include access, pre-determined fire lines, and potential sites for indirect attack.

Each park will coordinate with the local NCFS staff, NRP staff, and other appropriate sources to determine the most appropriate management strategies for wildfires or escaped prescribed fires. Fire suppression planning must address the following topics:

- Criteria for imposing burning restrictions or park closures in accordance with the severity of forest fire conditions, in coordination with NCFS.
- Procedures for detecting, locating, and reporting wildfires in the park.
- Expected local or regional fire behavior patterns.
- Identification of wildfire suppression strategies that will minimize secondary impacts to park resources.
- Delineation of specific duties for each staff member in case of a wildfire.
- Criteria and procedures for visitor evacuation and other public safety measures.

On days when the NWS declares a red flag warning, or when the NCFS readiness level five is reached, or at the discretion of the PASU:

- Park staff will increase the frequency of patrols.
- Open fires may be prohibited.
- All unusual smoke will be checked by park staff to determine its origin.

6.4 Wildfire Response

Crew safety will be the primary concern at all times during fire response operations. Untrained and improperly equipped personnel are not to be placed on the fire line, and at no time will crew safety be compromised when fighting a wildfire. Once a fire is declared a wildfire the burn boss transitions into an incident commander. DPR burn bosses and incident commanders are expected to know when to request assistance from outside agencies, when to pull personnel off the line, and also to adequately brief the crew about all safety issues prior to beginning response activities, including escape routes, special terrain or fuel concerns, and emergency contingencies.

The full range of suppression techniques may be considered, with the level of response being the responsibility of the NCFS's on-site incident commander. Where practical, all appropriate measures should be taken to minimize secondary impacts to the park's natural and cultural resources. Although the characteristics of wildfires are difficult to predict, prior planning and adequate preparation can reduce the adverse impacts of fire suppression activities, e.g., by identifying pre-existing control lines.

If the incident commander deems it appropriate, then unplanned or escaped fires may be managed by allowing them to burn out to established, defensible fire lines, such as roads, trails, streams, or other fire lines. During or following all wildfires, the NRP will be promptly notified so they can assess ecological damage to the natural resources and recommend remedies.

6.5 Burn Units and Fire Lines

Prescribed fire units will have discrete, but not necessarily permanent, boundaries. The names and boundaries can and do change with time. The defining document for any burn unit is the prescription and accompanying map. Whenever possible, prescribed fire units will encompass as much of a particular habitat type as possible limited by logistics and smoke management considerations. Larger burn units have many advantages and it is encouraged to make a prescription as large as safely, operationally, and ecologically possible. Units may be burned in combination with others or subdivided at the discretion of the burn boss and EBC in order to address resource needs, personnel, logistics, smoke, etc.

Each unit's fire lines will, whenever possible, utilize pre-existing barriers, such as roads, hiking trails, streams, and shorelines. New control lines may need to be created. Plowed lines are allowed, but should be avoided whenever possible, particularly at ecotones. In general the least destructive methodology that is safe and effective should be utilized. All DPR properties with plans to burn on perimeter burn units must have control lines in close proximity to the property boundaries capable of controlling prescribed and wild fires. Ultimately it is the burn boss in consultation with the EBC and PASU who will decide the best method if new lines are to be created. Fire lines can be kept open through blading with dozers, raking, disking, mowing, blowing, or other methods.

6.6 Burn Unit Prescriptions

Burn Unit Prescriptions are a required document for all North Carolina prescribed fires and is required by state law to be in the possession of the burn boss on every fire. The prescription contains detailed information defining where and how a prescribed fire will be conducted and the contingencies in case of escape. A prescription may describe a single burn unit or multiple burn units; the burn unit(s) is defined by the maps associated with the prescription. Prescriptions will be developed through the collaboration of park staff, the EBC, the NRP, NCFS staff, and other appropriate resources as needed. Unit prescriptions will address all of the ecological, logistical, meteorological parameters and safety concerns that are required for any given unit. Weather parameters will be expressed as an acceptable range across which ignition may occur and should include parameters for the appropriate season(s) of burn.

Prescriptions are to be reviewed before each use and updated, if needed to reflect changes in a unit's management status, vegetation, etc. Particular attention should be paid to a unit's management goals, burn rotation, rare species, smoke management, hazards, emergency extraction points, and general ecological parameters.

The EBC or natural resource staff will have the latest preferred format for new prescriptions. Most prescription formats are acceptable as long as it contains at minimum the following information. Those marked with an asterisk are required by state law (Appendix 1, North Carolina Prescribed Burning Act), all others are DPR requirements.

- *Landowner name and address (implicit in a park burn plan)
- *A description of the area to be burned

- *A map of the area to be burned
- *An estimate in tons of the fuel to be burned
- *The objectives of the prescribed burning.
- *A list of the acceptable weather conditions and parameters for the prescribed burning sufficient to minimize the likelihood of smoke damage and fire escaping into adjacent areas.
- *If applicable, the name of the NC certified burner responsible for the burn (NOTE: Certification is recommended but not required for current DPR burn bosses)
- *A summary of the methods that are adequate for the particular circumstances involved to be used to start, control, and extinguish the prescribed burning.
- *Provision for reasonable notice of the prescribed burning to be provided to nearby homes and businesses to avoid effects on health and property.
- DPR Signature Page
- Complexity Analysis
- ICS Form 214 for recording crew members and events of the day
- Latitude and Longitude of the burn
- Smoke Sensitive Areas
- Emergency access points
- Natural communities
- Burn objectives
- Rare or exotic species, ecological or safety hazards
- Organization and Equipment
- Burn Categories
- KBDI
- Special Situations/Instructions
- Pre burn checklist and post-burn evaluation

All new and existing prescriptions must be reviewed and approved by the EBC prior to implementing the prescription.

All prescriptions will contain a complexity analysis as described in the National Wildfire Coordinating Group complexity guide (NFES #2474 or its replacement). Unit prescriptions that receive a high complexity rating will be performed only with outside agency coordination and with personnel experienced on similar complexity fires. The EBC will determine during day-of-burn notifications whether the complexity analysis remains appropriate.

6.7 Burning Categories and NCFS Readiness Plan Levels

Prescribed fires conducted by NC DPR staff can occur under any NCFS Burning Category as long as the Division follows NCFS Smoke Management Guidelines. The NCFS updates their smoke management guidelines and posts them on their website as needed to comply with federal and state laws and internal policies. DPR will adhere to their policies as they evolve.

Normally, prescribed fires will be allowed only under NCFS Readiness Plan levels 1-4. Prescribed fire is allowed under Level 5 if exercised with extreme caution and approval of the NCFS. Each Forest Service District has a constantly updated readiness level that is found on their website as well as definitions of the readiness levels.

6.8 Pre-Burn Notifications and Checklists

Prior to ignition, the public will be notified via a press release to be coordinated through the Division PIO. This notice will inform the public of the anticipated dates and times of the prescribed fire(s) and will briefly address the management goals. This press release will also alert the public to the potential for smoke in and around the park.

Day-of-burn approvals must be received by the Division's EBC and the DISUs (or acting DISU) prior to ignition. Approvals may occur in person, by telephone, or by email, but must be received prior to ignition. In the absence of the availability of the EBC, technical approval can be performed by the NRPM or their designee.

Prescribed fires will either be cancelled or will be suppressed as soon as safely possible if the pre-burn checklist cannot be completed or if changes in weather, smoke management, or fire behavior exceed prescription parameters. It will be the responsibility of the burn boss to ensure that all personnel and equipment requirements specified in the pre-burn checklist have been met, that all weather parameters are within prescription, and that appropriate warning signs are in place. The completed pre-burn checklist must confirm the following points:

- Park has an approved fire management plan and prescribed fire plan.
- Proper burning permit obtained.
- All necessary equipment fully operational.
- Firebreaks inspected and determined to be adequate.
- Emergency protocols covered.
- Spot weather forecast has been obtained if required.
- Notifications made to: DPR PIO; NCFS; local fire departments; and any neighbors that have requested notice.
- Adequate protection in place for protecting vulnerable red-cockaded woodpecker trees, eagle nests, and park facilities.
- Warning signs, closures, or other public information in place.
- Adequate crew on-site and all crew members meet DPR firefighter training (or satisfy requirement of an MOU) and protective equipment requirements.
- All crew members have a radio or a partner with one.
- On-site weather parameters measured and ALL key parameters within prescription.
- Smoke dispersal conditions adequate; personnel posted at potential trouble spots.
- Emergency notification information collected for all personnel

6.9 Post-burn Mop Up and Summary

In areas with concerns about neighboring property, park facilities, high fuel loads, lingering smoke, etc., all fire will be extinguished and the fire line cold trailed at the discretion of the burn boss. Burn units will remain closed to visitors until the PASU and/or burn boss deem conditions to be safe.

Mandatory follow-up checks will be made at least once during the evening of the day of the burn and the morning following the burn. Additional checks will be at the discretion of the burn boss or PASU. There are two types of post burn summaries for prescribed fires. One is the Activity Log (Form ICS 214, readily available online). The second covers fire effect and ecological information (DPR Post Burn Evaluation, Appendix 4). Both should be uploaded into the fire management database within 30 days of the fire. Both forms are completed by the burn boss; the original will be kept in the park office files, with copies uploaded into the fire management database. All wildfires and escaped prescribed fires will also be reported via a PR-63.

7.0 SMOKE MANAGEMENT

7.1 Smoke Management Parameters

The burn boss has the authority and responsibility to limit impacts to SSAs . Prescriptions are to be written so that prescribed fires will be ignited under conditions that maximize combustion efficiency and minimize emissions. All fires will be scheduled to enhance convection and dispersion and to ensure that the smoke plume moves away from smoke sensitive areas. NCFS tracks fire-related smoke across the state via its Voluntary Smoke Management Program. This program tracks the volume of fuel scheduled for burning and informs cooperators of smoke limits on any given day. Smoke management requirements and limits vary across NCFS Districts, and it will be the responsibility of the burn boss to ensure compliance with all local regulations as well as with NCFS's Smoke Management Guidelines.

If night time smoke inversions are expected, all fire operations should be completed by one hour before sundown. The Low Visibility Occurrence Risk Index (LVORI, available on the NCFS website) can be used to predict nighttime inversions.

Smoke sensitive areas (SSA's) must be identified prior to ignition, and information on all SSA's must be included in the prescription. Any potential SSA's within 5 miles of the park should be considered when writing the prescription.

The burn boss has the authority and responsibility to cease ignitions if poor smoke dispersal or decreased visibility become significant on adjacent property or roads. To reduce the hazard of impaired visibility due to smoke on roads near a prescribed burn site, large, easy-to-read signs warning of smoke on the road will be posted when needed. If necessary, staff will be

stationed at appropriate locations to warn approaching vehicles. Traffic control assistance from local law enforcement personnel is to be requested as needed.

To minimize the health and safety hazards of smoke resulting from prescribed burns, burns will be conducted when meteorological conditions and with firing techniques that will keep the environmental impacts of the smoke within acceptable limits. If the burn prescription meets the NCFS smoke management criteria, then smoke management issues should be minimal. Predictive tools for smoke management are in constant development and it is the responsibility of Division burn bosses to stay current on the tools available. Examples of additional tools are found in Appendices 9 and 10.

7.2 Weather Monitoring

Weather parameters are to be closely monitored prior to and during ignition. Up-to-date fire weather and spot weather forecasts will be obtained prior to ignition when burning on category 1, 2, and 5 days. On-site weather conditions (temperature, relative humidity, probability of ignition, fine fuel moisture) prior to and during the fire should be collected at one hour intervals with a belt weather kit.

It is critical that the burn boss remain fully informed regarding fire weather and that all weather parameters remain within prescription during the burn. The Division could face serious legal consequences and containment costs if a prescribed fire is ignited out of prescription and escapes.

If discrepancies arise between the fire weather forecast and the spot weather, then burn bosses should ignite only after reconciling those differences. If discrepancies cannot be reconciled then the burn will be canceled.

It is important to note that each prescription's weather parameters will be expressed in ranges; differing combinations of those ranges will accommodate a variety of on-site weather conditions and could result in a variety of fire intensities and behaviors. When considering the interactions between weather, fuel models, and topography, burn bosses are expected to possess the knowledge and skill to reasonably anticipate fire behavior. In all instances, ignition should be based on the most conservative interpretation of the fire weather.

7.3 Test Fire

Test fires are to be ignited near the location that has been selected as the starting point for the prescribed fire and in fuel types common to the burn unit. The main fire is not to be ignited until the test fire is deemed to have demonstrated acceptable fire behavior and smoke management. If the test fire does not behave as anticipated, then it will be extinguished and the fire canceled.

8.0 TRAINING STANDARDS

Anyone participating in prescribed fires on DPR-managed lands will be required to obtain training ensuring that they have the skill to safely conduct prescribed burns, control minor wildfires, and to provide assistance to NCFS on major wildfires.

8.1 Basic Fire Crew Certification

All Division field staff participating in any aspect of fire management are required to have basic fire crew certification. This certification is open to any Division employee and requires:

National Wildfire Coordinating Group (NWCG) S-130 Firefighter Training; S-190 Introduction to Wildland Fire Behavior; I-100 Introduction to ICS; L-180 Human Factors on the Fireline.

Demonstrated proficiency with the DPR radio system.

Demonstrated proficiency with assigned firefighting equipment.

8.2 Maintenance of Basic Firefighter Certification

Basic firefighter status does not expire, but all Division fire personnel are encouraged to participate in at least one prescribed burn every year and to attend an annual refresher training (e.g., RT 130). Fire personnel must maintain proficiency with DPR's radio and fire control equipment.

8.3 Burn Boss Certification

The Division's goal is to have a certified burn boss at every park that utilizes prescribed fire. Following basic fire crew certification, any Division employee may apply for certification as a burn boss by completing the following:

- Approval of the candidate's supervisor.
- NWCG courses S290/390.
- Participation in an ecological burn class similar to RX 310 or classes or experience deemed equivalent by the DFMT.
- Participation in a minimum of six prescribed burns outside of burn boss apprentice burns.
- Certification from the NCFS through the Prescribed Burning Act.
- Plan and direct a minimum of two prescribed burns, one of which must be as an apprentice burn boss under the supervision of a DPR-certified burn boss.

The participation in six prescribed burns can be accomplished at any time during the certification process and be accomplished either within or outside the Division. With the exception of certification by the NCFS as an NC Prescribed Burner, all other DPR burn boss requirements must be completed prior to conduction apprentice burns

Application for burn boss status will be made to the Division's Fire Management Team by the applicant's supervisor. Based on training and experience, the DFMT will confer burn boss status for low complexity fires, medium complexity fires, or to require additional training. The DFMT

will forward recommendations for burn boss status to the Division Director for approval. Copies of the letter of approval will be forwarded to the CHOP, the DISU and NRPM. A low complexity burner can reapply to the DFMT for moderate complexity fires once they think their experience and training dictate.

8.4 Maintenance of Burn Boss Certification

To maintain certification, a burn boss must plan and direct at least one prescribed burn in a two year period. If the certification is allowed to lapse it can be reinstated by completing one apprentice burn under a DPR burn boss or NC state certified burner. All Division burn bosses must become NC certified burners through the NCFS within two years of approval of these guidelines in order to lead DPR fires.

8.5 Participation by Non-DPR Staff

Because of liability and safety issues, non-DPR staff who do not meet the DPR criteria for basic fire crew certification and/or who do not have the proper personal protective equipment (see Section 9.3) are generally not allowed access to the burn area when a prescribed fire is in progress. Training standards for non-DPR staff are addressed in the cooperative agreements between DPR and the other organizations. The burn boss can make exceptions to the training requirement, for instance with the media, as long as the visitor is supplied with PPE and is accompanied by fire-trained DPR staff. The burn boss can make exceptions to the training and PPE in special cases for media and others involved in educational programs but this must be cleared in advance by the EBC, DISU and CHOP.

9.0 EQUIPMENT AND SAFETY

Under no circumstances will fires be ignited without the minimum equipment and personnel specified in the prescription. All safety procedures will be vigorously enforced, safety equipment will be used properly at all times, and every precaution will be taken to minimize risks and avoid injuries.

All Division safety guidelines apply to activities involving any fire management equipment, including chainsaws, weed eaters, tractors, pumper units, bush axes, or similar tools. All fire crews must be instructed in the safe and proper use of all equipment. This should be accomplished by using fire control safety as a documented topic at park safety meetings. For prescribed burns, equipment instructions will be included in the pre-burn team briefing.

9.1 Equipment Inventory

The equipment needs for prescribed burns will be specified in the unit prescription and will depend on management goals, burning conditions, and the size of the burn unit. An inventory of fire control equipment, including type, quantity, condition and location will be documented in each park's fire management plan.

9.2 Physical Fitness

All participants in fire management activities must possess physical strength sufficient to work at heavy manual tasks for considerable periods of time under trying conditions. Crew members are expected to inform the burn boss of any health limitations prior to ignition. The burn boss or PASU should not allow any person to participate in a burn if a physical condition exists that would cause that person to be a hazard to themselves or to others, or that would prevent efficient performance of the duties required for wildfire control or prescribed burning.

9.3 Personal Protective Equipment

All fire crew personnel will wear the mandatory clothing and personal safety equipment listed below. Because of safety and overriding liability issues, under no conditions will personnel without flame resistant clothing be allowed on the fire line or in an area where fire management activities are occurring.

Mandatory Clothing

- Body covering: flame-resistant fire shirt and fire pants; or 1-piece flame resistant jumpsuit.
- Gloves: Leather or combination leather and cotton.
- Boots: Minimum 8 inch leather with no steel toe.
- Hard Hat approved by OSHA for fire applications.
- Portable fire shelters.
- Safety glasses or goggles.

Optional Clothing

- Kerchief or respirator
- Flame-resistant face and neck flap.
- Respirator or other device to minimize smoke inhalation.

9.4 Communications

Every crew member must have a radio or be paired with someone who does. All participants must be familiar with DPR radio guidelines and procedures. Clear and common text will be used at all times; calls signs will not be allowed.

9.5 First Aid

Fully stocked first-aid kits and an ample supply of drinking water must be located within all vehicles involved in prescribed burns or wildfire control. There must be someone trained as a First Responder on all fires. The burn boss will make the decision if ignition must cease in the event of an injury requiring the evacuation of any crew member.

9.6 Pre-burn Briefing

A team briefing and site inspection will be conducted before each burn. The following points are to be covered in the pre-burn briefing and at any team meeting during wildfire suppression:

- Identification of safety zones and escape routes
- Walking or driving tour of the unit if possible.
- Entry and pick-up locations for emergency medical personnel.
- Fuel models, vegetation types, ignition patterns, and anticipated fire behavior.
- Heat exhaustion prevention and treatment.
- Emergency procedures and phone numbers.
- Location of first aid.
- Radio check.
- Team assignments, equipment locations, and any special circumstances.
- Confirmation that all crew members meet minimum DPR equipment standards.
- Physical condition of all crew members adequate for their task is confirmed.
- Burn unit map for each crew member

9.7 Public Safety

Access by anyone other than DPR personnel will be allowed only under conditions that have been agreed to in advance by the burn boss or incident commander and PASU. Under no circumstances will the public be granted access to any burn unit during a prescribed fire or wildfire. Staff vehicles must turn lights and flashers on. All trails leading to the burn unit will be signed as closed, and a pre-burn inspection will be conducted to confirm that no park visitors are in areas closed as part of the burn unit prescription.

10.0 MONITORING AND REPORTING

10.1 General Information

The total acreage burned and the environmental effects of wildfires and prescribed burns will be recorded and monitored to determine if the park's fire management objectives are being met. It is vital that staff keep accurate burn records and develop a long term monitoring plan, since fire effects will dictate revisions to the park's fire management plan. A reporting and monitoring program will be included in each park's fire management plan, and a record of all wildfires and prescribed fires will be maintained by the park, with copies of all information provided to the NRP.

Prescriptions, maps, and DPR Post Burn Evaluations (Appendix 4) must be uploaded into the Fire Management Database. The database will be administered by the Natural Resource Program but access is available to all superintendents and burn bosses. The DPR Post Burn Evaluation in Appendix 4 is an example of the types of data and format in use at the time of writing these

guidelines. The form and specific data may change but the essential information will likely remain unchanged.

The PASU should obtain assistance as needed from other Division personnel or volunteers in developing and implementing a monitoring program. Monitoring techniques must be consistent, simple, repeatable and reliable. The procedures used should be standardized methods tailored to individual sites, situations, and needs.

Fire effects monitoring will provide park staff with opportunities to develop long term cooperative research projects with a variety of agencies, including university level scientists. Park staffs are strongly encouraged to identify and enlist the participation of appropriately skilled and knowledgeable researchers and volunteers in documenting pre- and post-burn fire effects.

10.2 Wildfires

For wildfires or escaped prescribed fires, the park superintendent will document the fire's effects by completing the applicable sections of the DPR Post Burn Evaluation and uploading it to the fire database. All wildfires must be reported to the DFMT for evaluation and possible remedies to suppression efforts. Additional monitoring activities will be conducted as deemed appropriate. Where feasible, wildfire areas will be maintained as burn units and incorporated into the prescribed fire plan. All escaped prescribed fires will be reviewed by the DFMT and their report sent to the Division Director. A PR-63 must be completed for all wild fires.

10.3 Prescribed Burns

A Burn Summary Report will be recorded for every prescribed fire, with copies to be retained by the park and uploaded to the DPR fire database. The type and extent of prescribed burn monitoring will depend upon the circumstances of each burn unit. Considerations in developing an appropriate monitoring program are: the burn management objectives; the significance of species and communities; the amount of information available to help predict fire effects; the experimental design; and the logistical constraints. Rare and exotic species, or species or areas of particular ecological concern will be noted and mapped.

10.4 Photo Transects

As a minimum level of monitoring, photo reference points can be established on fire units. When using this technique the locations of these transects are to be permanently recorded so that photo orientation will remain consistent. Photos are to be taken with the same orientation and should include some type of reference tool indicating height.

Photos should be taken during the growing season so that the unit's vegetation composition and structure can be documented. When combined with the pre-burn inventory data, these photos will document a visual baseline for future comparisons. After a unit is burned, a set of annual follow-up

photos can be taken as closely as possible to the same date as the baseline set for that unit. In addition, a set of before and after photos should be taken for every prescribed burn.

10.5 Rare Species and Communities

The presence of rare species and communities of special concern warrants detailed planning and monitoring data collection. Rare species and communities should be monitored to determine if the biological objectives stated in the park's fire management plan and burn unit prescription are being met. For these special elements, permanent research plots should be established and sampled to evaluate the effects of prescribed burning, and to determine if changes in the burning program are needed. Protection protocols will be addressed in the burn unit prescription for all rare or sensitive species and community types.

10. 6 Additional Monitoring

Additional monitoring activities may include collecting specific information on fire behavior or documenting overall site and biological effects. Examples of burn monitoring tasks are:

- Observing fire behavior and weather during burning to compare predicted and observed fire characteristics.
- Documenting the fire event, fire containment, and logistical problems to provide a permanent record and to improve future performance.
- Recording effects on fuels to determine if fuel modification goals were achieved.
- Measuring ecological parameters to assess achievement of biological objectives.
- Photo points.

11.0 PUBLIC RELATIONS

The public and media outlets will be informed about the status and results of significant wildfires, the scheduling of individual prescribed burns, and the objectives of the overall prescribed burning program.

11.1 Wildfires

As soon as is reasonable, the PASU will notify the Director' s office and the Division PIO through the DISU and the CHOP of any wildfire or escaped prescribed fire that is on or threatening park property. If the fire continues for more than one day, the PASU will give the PIO a daily status report. All media information releases concerning wildfire will be coordinated through the Division PIO.

News releases concerning park burning restrictions or closures due to fire hazards will be coordinated through the Division PIO in compliance with Staff Directive 87-2, and upon recommendation of the NCFS staff.

11.2 Prescribed Burns

The PASU will coordinate with the Division PIO in developing a press release for local media outlets. Adjacent landowners will be notified of the anticipated burn date by telephone, letter, visit, email, or press release.

The PASU will have a clear understanding of the history of fire in the park, and will be expected to explain clearly the purposes and objectives of the burn to the press or public. The PASU will respond appropriately to any complaints or requests for information as soon as possible, and will document all public participation and comments.

11.3 Access to Burn Sites by Media Personnel

Any fire that is approved for media coverage by the CHOP and the burn boss will be subject to the points covered in Section 8.5.

12.0 INTERPRETATION

Building a public awareness of the role of fire in our environment is important in supporting the goals of sound fire management. Educational programs on fire ecology will be incorporated into the park's Interpretation and Education program, visitor center exhibits, and other public programs.

12.1 Interpretive Activities

Each park participating in prescribed burns will develop information as part of any program on fire, or as a handout when responding to public inquiries. Where appropriate, fire ecology should become an Interpretation and Education theme. Preparation of video footage and photos during a burn is encouraged for future uses in programming and training. Technical assistance will be provided by the DIES, NRP staff, and other sources as appropriate.

12.2 Restrictions

No prescribed burn will be advertised or used as an interpretive program unless authorized by the DISU and the DPR PIO. Visitor access will be subject to the conditions of Section 8.5.

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